

Model 3004 Series **Neutron Dose Survey Meter** with Optional Internal Gamma Detector

Features

- Moderated Neutron Detector
- Range: 0 - 100 mSv/h (0 - 10,000 mrem/hr)
- Gamma Rejection up to 0.1 Sv/h (10 R/hr)
- Large Backlit LCD for Ease of Reading
- Auto-Ranging
- Rate, Max, Count & Dose Modes of Operation
- Splash-Resistant Construction for Outdoor Use
- All-Digital Calibration
- Lightweight and Ruggedly Built
- 4-Button Intuitive Interface for Easy Operation

Introduction

The Model 3004 Neutron Dose Survey Meter combines a handheld digital meter with a 22.9 cm (9.0 in.) diameter REM ball containing a ³He detector to measure and monitor neutron radiation. "i" versions include an internal gamma detector in the meter for exposure or dose measurements (see table at right for available versions). Each instrument features a large, easy-to-read LCD screen and audible alarms, and is controlled using a simple five-button interface. The meter body is made of high-impact plastic, and splash resistant construction allows the instrument to be used outdoors.

Four modes of operation are available – RATE, MAX, COUNT, and DOSE – which can be selected by pressing the MODE button. Measurements can be collected in two sets of units (primary and secondary) for RATE and MAX modes in cps, cpm, Bq, dpm, mR/hr, mrem/hr, or μ Sv/h units. The user can switch between two sets of units by pressing the UNITS button. When enabled with the optional Lumic Data Logger Kit (see options), data can be logged in any of the operational modes using the LOG button on the handle. Up to 1000 data points can be stored internally.

Instrument setup can be done either through the front-panel controls or via the Lumic Calibration Kit (see options). An internal switch can be used to disable the front-panel setup feature to protect desired settings from inadvertent modification. User-adjustable settings include the calibration constant, dead time correction, efficiency, high voltage, pulse threshold, response time, count time, operational modes (Rate, Max, Count, or Dose), HV current overload level, and minimum and maximum display levels. The user may also set Primary and Secondary units, unit alarm levels, count alarm levels, and zero pulse protection time limit.

The Model 3004 is shipped ready to use with batteries and a calibration certificate.



Internal Detector Options

Model	Internal Detector / Range	Part Number
3004	N/A	48-4293
3004i	Energy compensated GM Background to 50 mSv/h (5 R/hr)	48-4442
3004i/1	CsI scintillator, 18 x 18 mm (not energy compensated) Background to 500 μ Sv/h (50 mR/hr) Sensitivity: 100 cpm/ μ R/hr	48-4442-1
3004i/4	Energy compensated GM Background to 500 mSv/h (50 R/hr)	48-4442-4
3004i/6	Energy compensated GM Background to 10 Sv/h (1 kR/hr)	48-4442-6

Specifications

MEASUREMENT RANGE: 0-100 mSv/h (0-10,000 mrem/hr)

DETECTOR: ³He proportional detector, 1.6 x 2.5 cm (0.6 x 1.0 in.) [D x L], surrounded by 22.9 cm (9.0 in.) diameter cadmium-loaded polyethylene sphere

SENSITIVITY: typically 10 cpm per μ Sv/h (100 cpm per mrem/hr) [bare AmBe neutrons]

ENERGY RESPONSE: provides an appropriate inverse RPG curve for neutrons from thermal through 7 MeV, provides response up to 12 MeV

GAMMA REJECTION: < 10 cpm through 0.1 Sv/h (10 R/hr) [¹³⁷Cs gamma]

THRESHOLD: -2 mV

HIGH VOLTAGE: adjustable from 300 to 2400 Vdc

OPERATING VOLTAGE: approximately 1200 Vdc

LINEARITY: reading within 10% of true value

INTERNAL DETECTOR ("i" versions): energy compensated GM or scintillation detector (see table on front)

MODES: four operational modes including rate, max, integrated dose, and count

DISPLAY: 3-digit LCD with large 20 mm (0.8 in.) digits.

Units: (k)(M)c, (k)cps, (k)(M)cpm, (k)(M)d, (k)(M)Bq, (k)(M)Bq/cm², (k)(M)dpm, (μ)(m)(k)(M)R, (μ)(m)(k)R/h, (μ)(m)(k)(M)Sv, (μ)(m)Sv/h, (μ)(m)(k)(M)Rem, (μ)(m)(k)Rem/h
Indicators: bar graph, radiation type (alpha (α), beta (β), gamma (γ), neutron (n)), model (MAX, INTG), three alarm levels (ALARM 1,2,3), fault messages (FAULT, OVERLOAD, LOSS OF COUNT, OVERRANGE), USB, wireless, audio, low-battery

DISPLAY RANGE: minimum and maximum display can be set to limit display to calibrated range.

- | | |
|--|-----------------------------------|
| • 00.0 cps to 999 kcps | • 0.00 μ Sv to 999 MSv |
| • 00.0 cpm to 99.9 Mcpm | • 0.00 μ Sv/h to 999 Sv/h |
| • 00.0 Bq to 999 MBq | • 0.00 μ Rem to 999 MRem |
| • 00.0 Bq/cm ² to 999 MBq/cm ² | • 0.00 μ Rem/h to 9.99 kRem/h |
| • 00.0 dpm to 999 Mdpm | • 0 c to 999 Mc (counts) |
| • 0.00 μ R to 999 MR | • 0 d to 999 Md |
| • 0.00 μ R/h to 9.99 kR/h | (disintegrations) |

BACKLIGHT: built-in ambient light sensor automatically activates low-power LED backlight, unless internal dipswitch is set to continuous-on (will reduce battery life)

USER CONTROLS:

- ON/OFF (non-"i" version): press to turn ON, short press to acknowledge alarms and silence alarm tone, long press to reset RATE/MAX, hold for OFF
- ON/AUD ("i" versions): extra-long press to turn ON, short press to adjust audio "click" level, extra-long press plus 3 seconds to turn OFF
- UNITS: short press changes the units between count rate, dose/exposure, or activity
- AUDIO (non-"i" version): short press to adjust "click" audio level
- DETECTOR ("i" versions): short press to change between external and internal detectors
- MODE: short press alternates between modes: RATE (displays count rate), MAX (captures peak rate), COUNT

(user-selectable preset count time from 0 to 31.68 years), and DOSE (current accumulated dose).

- LOG: short press to log current display (requires Lumic Data Logger Kit, see options) or initiate count in COUNT mode, extra-long press to change count in COUNT mode

RESPONSE TIME: user-selectable from 1 to 60 seconds, auto SLOW, auto FAST, fixed SLOW (22 s), fixed FAST (4 s)

ALARMS: three adjustable alarm setpoints for each unit in all four modes of operation

SELF-DIAGNOSTICS: detects and reports internal instrument issues, indicated by showing FAULT on the display and an audio warning

OVERLOAD PROTECTION: high count rate saturation protection prevents false display of lower count rates. If the instrument detects an overload condition, it will display the OVERLOAD icon and trigger an audio warning.

LOSS OF COUNT PROTECTION: after typically 60 seconds of no pulses from the detector, the alarm audio will be triggered and the LOSS OF COUNTS icon and the affected unit will be displayed

OVERRANGE: if the reading exceeds the predefined detector range, the instrument will flash a maximum reading, display the OVERRANGE icon, and trigger an audio warning

AUDIO: approximately 4.5 kHz, click audio greater than 65 dB at 0.6 m (2 ft), alarm audio greater than 72 dB

CALIBRATION PROTECTION: internal dipswitch to disable front-panel calibration parameter changes

POWER: four alkaline "AA" batteries

BATTERY LIFE:

Non-"i" versions: approximately 750 hours of operation

"i" versions: approximately 175 hours of operation

16-hour low battery warning

WORKING ENVIRONMENT: splash-proof shields for outdoor use

CONSTRUCTION: high-impact plastic with water-resistant rubber seals and separate battery compartment

TEMPERATURE RANGE: -20 to 50 °C (-5 to 122 °F), may be certified for operation from -40 to 65 °C (-40 to 150 °F)

ENVIRONMENTAL RATING: NEMA 3x / IP 53

SIZE (H x W x L): 41.1 x 23.1 x 25.1 cm (16.3 x 9.1 x 9.9 in.)

WEIGHT: 8.3 kg (18.3 lb), with batteries

Options

- Lumic Calibration Kit (PN: 4519-865)
- Lumic Configuration Kit (PN: 4519-747)
- Lumic Data Logger Kit (PN: 4498-1019)
- Bluetooth (PN: 4519-564)
- Headphone Jack (PN: 4498-555)
- Carrying Case (PN: 2310377)
- Rolling Case (PN: 2311487)

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Note: specifications subject to change without notification. We are not responsible for errors or omissions.